

What is claimed is:

1. An endoscope system comprising:

an endoscope having an insertion tube;

a main light source;

5 an auxiliary light source; and

a fiber-optic light guide provided in said insertion tube, said fiber-optic light guide being provided with an incident end face which selectively faces one of said main light source and said auxiliary light source, and  
10 an exit end face which faces an illuminating optical system provided at a distal end of said insertion tube;

wherein said auxiliary light source comprises a white LED.

2. The endoscope system according to claim 1,  
15 wherein said incident end face of the fiber-optic light guide normally faces said main light source, and faces said auxiliary light source in the event of failure of said main light source.

3. The endoscope system according to claim 2,  
20 wherein said auxiliary light source is movable between a retracted position where said auxiliary light source is aside from a position at which said auxiliary light source faces said incident end face of said fiber-optic light guide, and an operating position where said auxiliary  
25 light source faces said incident end face of said

fiber-optic light guide;

wherein said auxiliary light source remains in said retracted position when said main light source is ON; and

wherein said auxiliary light source moves to said  
5 operating position in the event of failure of said main light source.

4. The endoscope system according to claim 3, further comprising a positive lens positioned in front of said white LED so that said positive lens is positioned  
10 between said white LED and said incident end face of said fiber-optic light guide when said white LED is in said operating position;

wherein light rays emitted from said white LED are converged through said positive lens to be incident on  
15 said incident end face of said fiber-optic light guide; and

wherein said optical axis of said white LED is coincident with both an optical axis of said positive lens and an axis of said fiber-optic light guide when said white  
20 LED is in said operating position.

5. The endoscope system according to claim 4, wherein the front focus of said positive lens is coincident with a point of light emission of said white LED.

6. The endoscope system according to claim 4,  
25 wherein the following conditions (1), (2) and (3) are

satisfied:

$$(1) \quad r_1 \geq b \times \tan \theta_1$$

$$(2) \quad (a-c) \tan \theta_1 = r_2$$

$$(3) \quad \theta_3 \geq \theta_2$$

5        wherein "a" designates the image distance of said positive lens;

      "b" designates the object distance of said positive lens;

      "c" designates the distance between a principle plane  
10 of said positive lens and said incident end face of said fiber-optic light guide;

      "r<sub>1</sub>" designates the radius of said positive lens ;

      "r<sub>2</sub>" designates the radius of said incident end face of said fiber-optic light guide;

15        "θ<sub>1</sub>" designates the exit angle of said light rays emitted from said white LED;

      "θ<sub>2</sub>" designates the angle of incidence of light rays which emerge from said positive lens to be incident on said incident end face of said fiber-optic light guide;  
20 and

      "θ<sub>3</sub>" designates the threshold angle of incidence of light rays on said incident end face which are transmittable through said fiber-optic light guide.

7.        The endoscope system according to claim 4,  
25 wherein an effective aperture of said positive lens is

equal to a diameter of said incident end surface of said fiber-optic light guide; and

wherein the front focus of said positive lens is coincident with a point of light emission of said white  
5 LED.

8. The endoscope system according to claim 3, further comprising a video processor in which said main light source and said auxiliary light source are provided.

9. The endoscope system according to claim 8,  
10 wherein said video processor comprises a moving device for moving said white LED between said retracted position and said operating position.

10. An endoscope system comprising:  
an endoscope having an insertion tube; and  
15 a lighting system having a main lamp and a white LED serving as an auxiliary lamp,

wherein said endoscope includes a fiber-optic light guide provided in said insertion tube, an incident end face of said fiber-optic light guide normally facing said  
20 main lamp when a distal end of said insertion tube is plugged into a socket provided on said lighting system,

wherein said lighting system includes a moving device for moving said white LED between a retracted position where said white LED is aside from a position at which  
25 said white LED faces said incident end face of said

fiber-optic light guide and an operating position where  
said white LED faces said incident end face of said  
fiber-optic light guide,

wherein said white LED remains in said retracted  
5 position when said main lamp is ON, and

wherein said moving device moves said white LED from  
said retracted position to said operating position in the  
event of failure in said main lamp.

11. The endoscope system according to claim 10,  
10 wherein said lighting system is incorporated in a video  
processor.